

DIGITAL INDICATOR

DN-830

User manual



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TABLE of CONTENTS

1. Overview	3
2. Specifications	4
3. Front panel	6
4. Back panel	9
5. Installation	11
6. Calibration	12
7. Equipment setting	17
8. INTERFACE	35

Chapter 1. Overview

1-1 Introduction

This indicator is to control the weight indication and designed to be most applicable to all types of gauges when broadly applied to a wide range of industries (packing machine, weight sensor, flecon scale, various stretchers, and compress test equipment).

As RS232C 4 PORT is an optional installation, this product is available to communicate with external equipment including computers.

In addition, because 3 relay outputs, that are required for control, are provided as the standard option (only when RELAY OUT exists), it is convenient to use for control purposes.

Before using this machine, please read this manual completely for proper use, and thoroughly utilize all the functions this product has.

1-2 Special features

- Shielding measure counter to external Noise
- Embedded self-diagnose and self-failure-restoration function
- Indication precision 1/20,000
- Static electricity data memory function
- 2 Embedded terminals for external input (zero point, with container/ without container)
- Data memory function
- By using DC power, input power can be used in 12V-24V regardless of polarity (300mA or over is advisable)
- FAC (Full Auto Calibration) mode for Calibration
- Equivalent input mode for Calibration
- Option: 422 (additional option)
- Option: 232 (additional option)
- Option: 4-20mA (additional option)

1-3 Safety Measures

- Don't drop or jar in any way.
- Don't install in a high voltage area or location with heavy electrical noise.**
- Don't install in direct sunlight or area with heavy vibration.
- Don't let this product get wet.
- Please turn off switch when connecting it to peripherals.

1-4 Components


- User manual
- Option (additional option): adaptor: 1 (12V / 500mA)

Chapter 2. Specifications

2-1. Load cell input and A/D convert

Input sensitivity	0.3 / D
Zero point adjustment range	- 0.6mV ~ + 1.5 mV
Load cell approved voltage	DC 10V (±5V)
Maximum load cell input voltage	32mV
Temperature coefficient	zero point: ±10 PPM / °C SPAN: ±10 PPM / °C
Input noise	±0.6 P.P
Input Impedance	10 or over
A/D converting method	$\Delta\Sigma$
A/D resolution	520,000 Count (19bit)
A/D converting speed	200times / Sec
Non-linearity	0.01% FS

2-2-1. Digital parts

Classification	Display	Specifications
Indicator	Weight	7-Segment, 5 digit red, high luminance LED indicator letter size: (H)12.7 X (W)7.3mm
Weight part display content	One gradation value	x 1 x 2 x 5 x 10 x 20 x 50
	Display under zero point	" - " Minus Sign
	Decimal point place	0, 0.0, 0.00, 0.000, 0.0000
Status Display 1	Zero, Stable, Low, High, Ok, Hold, Comm	Green LED 3 ϕ 7 Lemp
Key	Functional key	

2-3. General specifications

Usable power	DC 12 - 24V (without polarity) approximately consume 200~300mA
Usable temperature	-5°C - 40°C
Usable humidity	85% Rh or lower (should not have beads of water on it)
Product size	(W)100 X (H)52 X(D)125
Product weight	Approximately 450g

◆ **Note:** For the improvement of performance and functionality, the specifications of this product may be changed without advanced notice to the consumer.

2-4. OPTIONS

Option 1	RS422
Option 2	RS232
Option 3	4~20mA
Option 4	0~10 V

Chapter 3. FRONT PANEL



3-1 Display part

- 1) Weight: displays current gauge weight
 - Whenever setting keys are pressed, corresponding values: high limit, low limit, and drop will blink.





3-2 Status display

- 1) Zero point (Zero) : It is lit when the weight is "0".
- 2) Stable (STABLE) : It is lit when the weight is stable.
- 3) Low limit (LOW) : It is lit when the weight is below the limit.
- 4) High limit (HIGH) : It is lit when the weight is over the limit.
- 5) Complete (OK) : It is lit when gauging is complete.
- 6) Hold (Hold) : It is lit when the weight is in hold.
- 7) Communication (Comm) : It is lit in communication status.

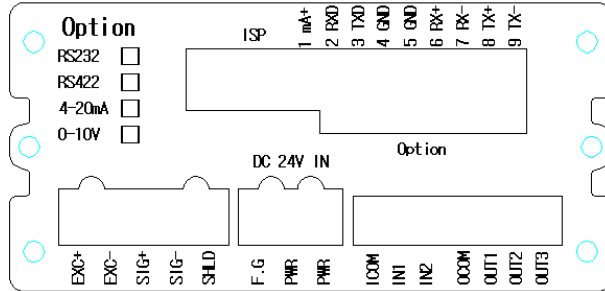
3-3. How to use KEY

	It is used to set the weight indication at '0' within a specific range of maximum weight indication value set by the user. (It only operates within the range that has been input in 'equipment setting' '08'(zero point range setting))
	It is used to set the container weight at '0' after it is on the weighing plate. (It only operates within the range that has been input in 'equipment setting' '09'(container range setting))
	It is used when inputting the product number, low limit (SP1), high limit (SP2), complete (SP3), and range value.
	It is used when inputting the setting value.

3-4. How to use special KEYS

	<p>① It is used to increase the figure. ② It is used to complete the setting in SET.CAL status.</p>
	<p>① It is used to move the position of the figure. ② It is used to move the Teat mode in SET.CAL status.</p>
	<p>① It is used to increase the identification number (F XX) in 'equipment setting.' ② Press 'SET.CAL' status to move to 'equipment setting' (SET UP).</p>
	<p>① It is used to input (save) setting values in the 'calibration' function. ② Press it in 'SET.CAL' status to move to 'Calibration.'</p>

Chapter 4. Back panel



① POWER

Fuse: AC 250V 2A

DC IN: As this product uses a DC power source, DC 12V – 24V is available.

② OPTIONS

RS-422 (4P Connector I/F) communication (additional option)

RS-232 (3P Connector I/F) communication (additional option)

4~20mA (0~10V) (2P Connector I/F) (additional option)

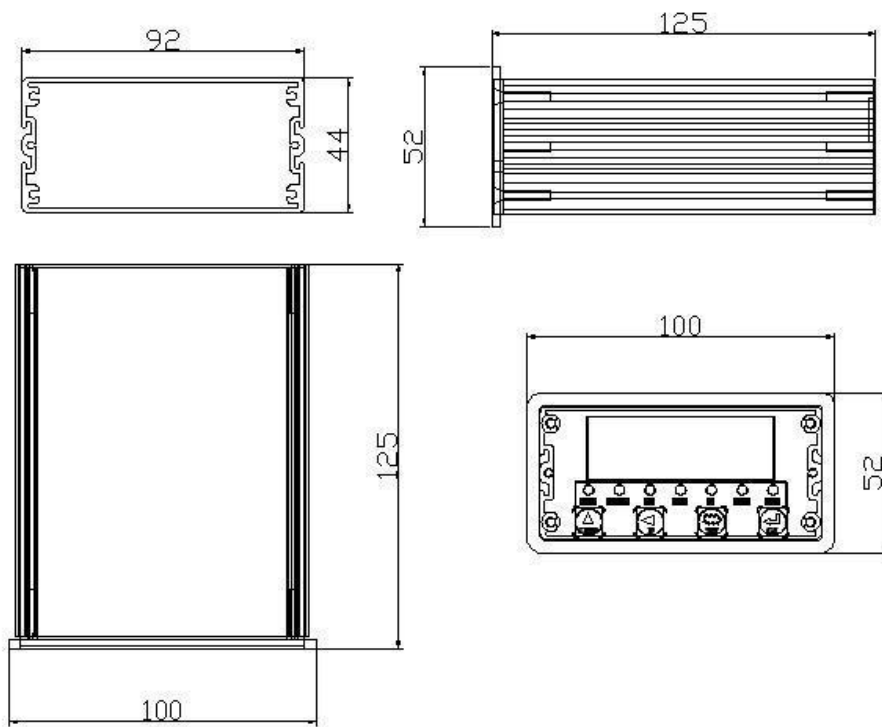
③ External input

1	+EXC	-	load cell connect terminal
2	-EXC	-	load cell connect terminal
3	+SIG	-	load cell connect terminal
4	-SIG	-	load cell connect terminal
5	SHIELD	-	load cell connect terminal
6	F.G	-	grounding
7	PWR	-	DC IN 12V~24V (input regardless of polarity)
8	PWR	-	
9,10,11	ICOM, IN1~2 (INPUT)	-	refer F11 in F-Function mode
12,13,14,15	OCOM, OUT1~3 (OUTPUT)	-	refer to F21 in F-Function mode

Chapter 5. Installation

5-1 External dimensions and cutting dimensions

(Unit): mm




Chapter 6. Calibration


What is calibration?


Calibration indicates the adjustment in weight indication, which makes the displayed figure coincide with actual weight.

6-1. Definition of each mode






☞ Supplying power while pressing any key on the front, you can go into Test screen mode .

Press  Key: this will change it from TEST1 to 9 by sequence, and then return to TEST1.

- Press  Key to go into test mode. For an explanation of each mode, please refer to the table below.

- After setting up or checking in each mode, press  Key again to return to TEST 1 mode. (Except TEST3)

- Press  Key to go into ST.CAL.


TEST 1	- You can check the status value (A/D) at zero point weight.
TEST 2	- You can check the operation of each key.
TEST 3	- This mode allows span adjustment and equipment setting in SET,CAL mode. (Refer chapter 6-3, and 7) ☞ To return to one of the other modes from this status, press  Key.
TEST 4	- This is the DISPLAY test mode. Press  KEY to return to TEST.
TEST 5	- This is the RELAY OUTPUT test mode. Press  KEY to return to TEST.
TEST 6	- This is the INPUT test mode. Press  KEY to return to TEST.
TEST 7	- This is the selection of analog amplification. Press  KEY to return to TEST.

6-2. SPAN adjustment

SPAN adjustment sets linearity to make the indication value from "0" to the maximum weight, which is standard for the weight indication on the indicator, coincide with actual weight.

► Inter to SPAN adjustment

- Supply power while pressing  key
- TEST is indicated on display part.
- Press , then ST.CAL. is displayed.

- Press,  then CAL_1 is displayed, and enter general weighing mode.

► How to adjust SPAN

- To process, use  Key
- To reverse, use  Key


► General calibration mode (CAL 1 Mode)


I . Step 1




This step sets the gradation value (minimum indicating gradation unit).

Here, D stands for Division, and it shows "one gradation value (display minimum gradation)."

Pressing the  KEY will change the display to "01 → 02 → 05 → 10 → 20 → 50" by sequence.

Pressing the  KEY decreases the display in reverse order.

Press the  KEY to get out of ST.CAL.

Press the  KEY, then it memorizes "one gradation value." Move to the next step.


II . Step 2





This step sets the maximum indicating weight (Capacity).


Here, "CAPA" is the abbreviation of Capacity, and it shows the maximum indicating weight that can be weighed at this gauge.

Instead of the random figure currently displayed, the user can input his desired maximum indicating weight value.

Pressing the  KEY will increase the number from 0 → to 9.

Pressing the  KEY will move the position to the left.

Press the  KEY to move to gradation value setting.

Press the  KEY to save the currently designated value as the maximum indicating weight value. Move to the next step.

✘ Do not set one gradation value/Maximum indication value at more than 1/30,000, respectively.

1/30,000 is the greatest value that can be set.


III. Step 3




This step checks the current zero point status of the gauge.
The random figure A/D indicated on the display part is at calibration zero point.

The  KEY is not used.

The  KEY is not used.


Press the  KEY to move to the maximum indicating weight setting.


Press the  KEY to save currently displayed zero point value.
Move to the next step.


IV. Step 4




This step puts the prepared weight pendulum on the gauge.
The standard weight pendulum weighing 10% or more over the maximum weight (CAPA) needs to be prepared.

Press the  KEY to increase the number from 0 -> to 9

Press the  KEY to move the position to the left

Press the  KEY to move to zero point status check.

Press the  KEY to save the currently displayed weight pendulum value. Move to the next step.

While raising the gauge bar to the third level, proceed to step 5.




V. Step 5



The constant value of the span is indicated on the display, C.EnD. will be blinking, and then it will go into weight mode after resetting.

► equivalent input mode. (CAL 2 Mode)

► Goes to SPAN adjustment

- Supply power while pressing the  key on the front face
- TEST is indicated on the display.
- Press the  key to display ST.CAL.
- Press the  key for CAL._2. It will then go to the equivalent input mode.


I . Step 1




This step is to set gradation value (minimum indicating gradation unit).

Here, D is the abbreviation of Division, and it shows "one gradation value (display minimum gradation)."

Pressing the  KEY will change the display to "01 → 02 → 05 → 10 → 20 → 50" by sequence.

Pressing the  KEY decreases the display in reverse order.

Press the  KEY to get out of ST.CAL.

Press the  KEY, then it memorizes "one gradation value." Move to the next step.


II . Step 2





This step sets the maximum weight (Capacity) written on the load cell.


Here, "CAPA" is the abbreviation of Capacity, and it shows the maximum indicating weight that can be weighed at this gauge.

Instead of the random figure currently displayed, the user can input the maximum indicating weight value presented in the load cell.

Whenever pressing the  KEY, the number increases from 0 → to 9.

Press the  KEY to move the position to the left.

Press the  KEY to move to the gradation value setting.

Press the  KEY to save the currently designated value as the maximum indicating weight value. Move to the next step.

III. Step 3



This step checks the current zero point status of the gauge.

The random figure A/D indicated on the display part is the calibration zero point.




The  KEY is not used.




The  KEY is not used.



Press the  KEY to move to a maximum indicating weight setting.



Press the  KEY to save the currently displayed zero point value.

Move to the next step.


IV. Step 4




This step is to input the mV/V value presented on the load cell.

Ex) If 2mV/V is indicated on the load cell, then input 2.0000.




Pressing the  KEY increases the number from 0 -> to 9.




Pressing the  KEY moves the position to the left.



Pressing the  KEY moves the display to zero point status check.



Press the  KEY saves the currently displayed weight pendulum value. Move to the next step.

While raising the gauge bar to the third level, proceed to step 5.

V. Step 5



The constant value of the span is indicated on the display part. C.EnD. will be blinking and then go into the weight mode after resetting .

※ For the weight setting of the weight pendulum

If one gradation value/Maximum indication value is 1/5,000 or less, prepare the weight pendulum weighing 10% or more of the maximum indicating gradation, and set that value. If one gradation value/Maximum indication value is 1/5,000 or greater, then prepare the weight pendulum weighing 20% or more of the maximum indicating gradation, and set that value. This is the way to adjust the Span more accurately.

– When setting the weight of the weight pendulum higher than the maximum indicated gradation, an Error 04 Message will be displayed.

- When setting the weight of weight pendulum at less than 10% of the maximum indicating gradation, an Error 05 Message will be displayed.

6-3. Error display status and follow up action

Se1.	Class	Cause	Follow up action
1	Err 01	Displayed when the maximum indicating gradation/one gradation value is over 20,000	- Re-input the maximum indicating gradation and one gradation value, those not over 20,000.
3	Err 04	When the weight of the weight pendulum is set higher than the maximum indicating gradation	- Re-input the weight setting value for the weight pendulum to less than the maximum indicating gradation.
4	Err 05	When the weight of the weight pendulum is set at less than 10% of the maximum indicating gradation	- Re-input the weight setting value for the weight pendulum to over 10% of the gradation.
5	Err 06	When the output value of the load cell is too large	- Check whether the weight on the gauge weighs as much as the value set for the standard weight pendulum. And if the standard weight pendulum on the gauge is weighs more than the setting value, please change it to meet the setting value.
6	Err 07	When the output value of the load cell is too small	- Check whether the weight on the gauge weighs as much as the value set for the standard weight pendulum. And if the standard weight pendulum on the gauge is less than the setting value, please change it to meet the setting value.
7	Err A	When calibration cannot be determined because the weight is shaking.	- In order to have stable gauging without any inflow of vibration, verify the surrounding environment, and separate the gauge from any source of vibration - Check that the load cell is not faulty - Check for any current leakage in the load cell connection line - Check the insulation resistance of the load cell
8	Err _8	When a figure that is not available in F-Function is input	- After check the figure, re-input the figure.

Chapter 7. Equipment setting

7-1. Equipment setting (SET-UP)

● Overview

This is the process to set the F-FUNCTION applicable to the actuator of the gauge and surroundings and to make the gauge operate at optimum status.

▶ How to go to SETUP


Supply power while pressing any key to display TEST on the indicator.


At this time, press the  Key. ST,CAL will be displayed.


At this time, press the  Key. 01-XX will be displayed.*

*"X" is a random number


▶ How to change the F-FUNCTION identification number

To change the F-Function identification number, press the  Key once. The identification number will increase. It will increase from 01 up to 53, and return to 01.



Press the  KEY to increase the number from 0 -> to 9.


Press the  KEY to move the position to the left.

After setting the figure, press the  KEY, then access the same function. Press again without a set figure, and the sequence will increase from 01 to 53.

Press the  KEY to save the currently designated value, and press one more to move to ST.CAL.

▶ How to change F-Function setting

For the functional setting of F-Function, input the figure to be changed, and press the  Key. It is then saved in the internal memory and the change is completed. If the desired figure is pressed without pressing the  Key, then that figure does not have input status.



* Only when the  Key is pressed in the status where the setting value is changed to the desired number will that value be saved in the internal memory.

7-1. F-FUNCTION LIST

F-Function	Initial value	Description	Distinction
00	-	Set-Up Calibration selection mode	Distinct with setting and input Key
01	3	Decimal point place setting	0, 0.0, 0.00, 0.000
02	0	Zero point memory mode	Normal (0), Back - UP (1)
03	1	MOTION BAND range	0, 1, 2, 3
04	1	ZERO TRACKING range	0, 1, 2, 3
05	0	AUTO ZERO range setting	00~99
06	5	Digital filter range	1~49
07	0	ZERO, TARE Key operation mode	For stable (0), For unstable (1)
08	3	ZERO Key operation range setting mode	2%(0), 5%(1), 10%(2), 20%(3), 100%(4)
09	3	TARE Key operation range setting mode	10%(0), 20%(1), 50%(2), 100%(3)
10	0	Hold function setting	Peak-hold (0), Sample hold (1), average 5 second hold (2)
11	3	External input setting	0,1,2,3,4,5
12	0	Front face key operation setting	0,1,2,3,4,5,6,7
13	0	Code number designation	0,1,2
14	0	Hold OFF time	0.0 - 9.9 seconds
21	1	Gauging mode selection	1,2,3,4,5
22	10	Gauging finish Relay ON delay time (When set to F32-1,F33-0)	0.0 - 9.9 seconds
23	10	Gauging finish Relay ON time	0.0 - 9.9 seconds
24	10	Gauging decision Relay ON delay time	0.0 - 9.9 seconds
25	10	Gauging decision Relay ON time	0.0 - 9.9 seconds
30	0	Serial 2 Parity Bit setting mode	NO(0), ODD (1), EVEN(2)
31	7	Serial 2 communication speed	0 ~ 9, 115200 bps ~ 2400 bps
32	0	Serial 2 communication mode	0: Stream Mode, 1: for stable Mode, 2: PRINT Key
33	1	Serial 2 communication method	0: one-way transmit Mode, 1: COMMAND MODE, 2: LCD MODE, 4: External indicator mode
34	1	Equipment number (ID NUMBER) setting	1~99
35	0	Transmit data FORMAT	0: basic FORMAT, 1: CAS FORMAT
36	0	BCC selection mode	0: BCC not using 1: BCC using
53	0	Average display indication setting mode	00-99 0: not operating, 1-99: operating.
54	0	Steady LED Status Lamp Delay time	0: Not use, 1: Use
80	50	NEAR ZERO (EMPTY) range setting	x x x x x x
81	1	Zero point indication range setting	x x x x x x
82	xxxxxx	Zero point deduction value setting	x x x x x x
83	0	analog output maximum value setting	x x x x x x
85	xxxxxx	equivalent circuit value input	x x x x x x
89	-	Calibration SPAN constant value checking	x. x x x x x

Input	IN1	IN2	
Usage	zero point	with container/without container	
Output	OUT1	OUT2	OUT3
Usage	SP3 (zero point)	SP2 (high limit)	SP1 (low limit)

■ Detail explanation for the functionality of F-Function

F00	Equipment setting (SET-UP), and Calibration (Calibration) selection mode	 Key Set-up
		 Key Calibration

(●) Initial setting value when delivered from factory)

Decimal point place setting				
F01		0	No decimal point	0
		1	One decimal place	0.0
	●	2	Two decimal places	0.00
		3	Three decimal places	0.000

Zero point memory mode				
F02	●	0	Normal Mode	
		1	Back-up Mode	

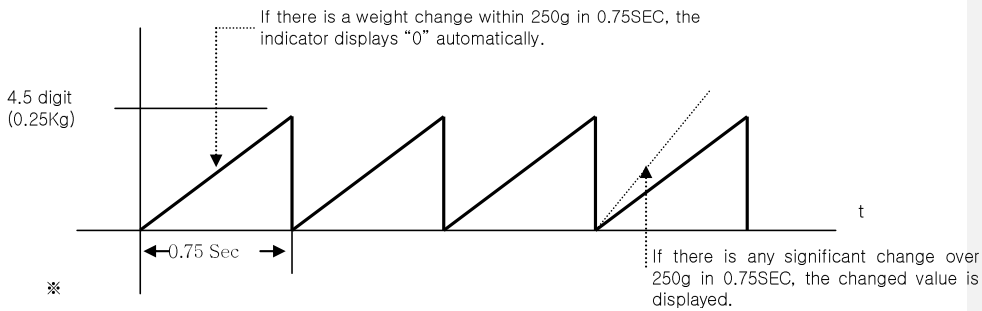
* At normal status, the weight input to the gauge is not saved during power failure or power OFF. Therefore, the power should be turned on only after removing the item from the gauge.
 * In Back-up status, when the power is on, the gauge reads saved zero point and straight up displays "0;" therefore, if the item to be gauged is inside the gauge, the weight is displayed when the power is on even if there has been a power failure or power OFF.

Motion Band range setting				
F03	1	0	This setting function decides the value to be set for the weight change range shows stable status.	
		3	0: place with minor vibration (approximately) – 3 : Place with heavy vibration (strong)	


* This function recognizes stable status when the weight change range is not over A/D Count setting range within a specific period.
 ※Usually, once the item to be gauged is put on the gauge, there is minor vibration. Thus, when the vibration is stable, the "stable" status indication on the display is lit. Setting the time range to stable vibration is "Motion Band."

Zero Tracking correction range setting			
F04	1	0 ┆ 3	When the weight is changed minutely (due to environment, temperature, wind, dust, etc.), and it is not over the specific range of gradation, this is automatic zero point correction.
Ex.) If F04 is set at "3" when the maximum indicating gradation is 120.00Kg, and one gradation value is set as 0.05Kg,			



메모 [A1]: This sentence is incomplete.



This is a function to prevent something from impacting gauging, when the dust stacks up on the gauge if the environment has dust and particles.

Auto - Zero range setting			
F05	00	00 ┆ 99	When the weight is displayed and stable lower than the set value, at that moment, it changes this indicated value to "0."
※ When this function is set, if there is a remaining amount, it can automatically capture zero point before re-gauging without using the  Key. ※ Ex.) At a gauge with the maximum indicating weight at 120.00Kg and one gradation value at 0.02Kg, if the value of F05 is set at 30, at the status with the remain amount up to ±(0.02-0.03Kg), zero point is operated and displays the value that changed to "0.00Kg" as soon as the STEADY LAMP is on.			


Digital filter Range					
F06	5	01 ┆ 49	weak ↓ strong	Place with minor vibration ↑ Place with heavy vibration	More Sensitive Less Sensitive
※ Please use this function after adjusting the setting value according to the environment (surrounding vibration). ※ In order to make the responding speed of the indicator faster, set value to a smaller number.					

ZERO, TARE Key operation mode			
F07	●	0	Only when the weight is stable can the  Key be operated.
		1	Even when there is a weight change, the  Key can be operated.


ZERO Key range setting mode

F08		0	Operating within 2% of maximum CAPA
		1	Operating within 5% of maximum CAPA
		2	Operating within 10% of maximum CAPA
	●	3	Operating within 20% of maximum CAPA
		4	Operating within 100% of maximum CAPA

※ Because the Indicator is set at 10% more for a tolerable range, if the maximum set weight is set at 100 , the actual maximum weight on the indicator becomes 110 .





Ex.) When the maximum set weight (CAPA) is set at 100 and F08 is set at "1," the  key is operated only within 1 (10%)

TARE Key range setting mode			
F09		0	Operating within 10% of maximum CAPA
		1	Operating within 20% of maximum CAPA
		2	Operating within 50% of maximum CAPA
	●	3	Operating within 100% of maximum CAPA

Ex.) When the maximum set weight (CAPA) is set at 100 and F09 is set at "2," the  Key is operated only within a 50kg range.

Hold function setting			
F10	●	0	Hold when maximum weight is detected (1time) (Peak-Hold)
		1	Hold current indicated weight when holding Key or, Input (Sample-Hold)
		2	Average hold for 5 seconds when holding Key or Input

External input setting				
F11	Distinction		IN 1	IN 2
		0	Start	Stop
		1	Start/Stop	with container/without container
		2	zero point	with container/without container
	●	3	hold	Remove hold
		4	zero point	Decision
		5	container	without container

Front face key operation setting						
F12	Distinction					
	●	0	zero point	with container/without container	Setting	hold/remove hold
		1	zero point	hold	Setting	Remove hold

	2	zero point	container	Setting	Without container
	3	zero point	Start	Setting	Stop
	4	zero point	Start/Stop	Setting	hold/remove hold
	5	zero point	Decision	Setting	hold/remove hold

Code number designation mode

F13	●	0	Fix
		1	After gauging one time, increase by 1
		2	After gauging one time, decrease by 1

Hold OFF time setting

F14	00	00-99	0 - 9.9 seconds
※ only for F10 setting 1 and 2 (Sample hold , Average hold)			

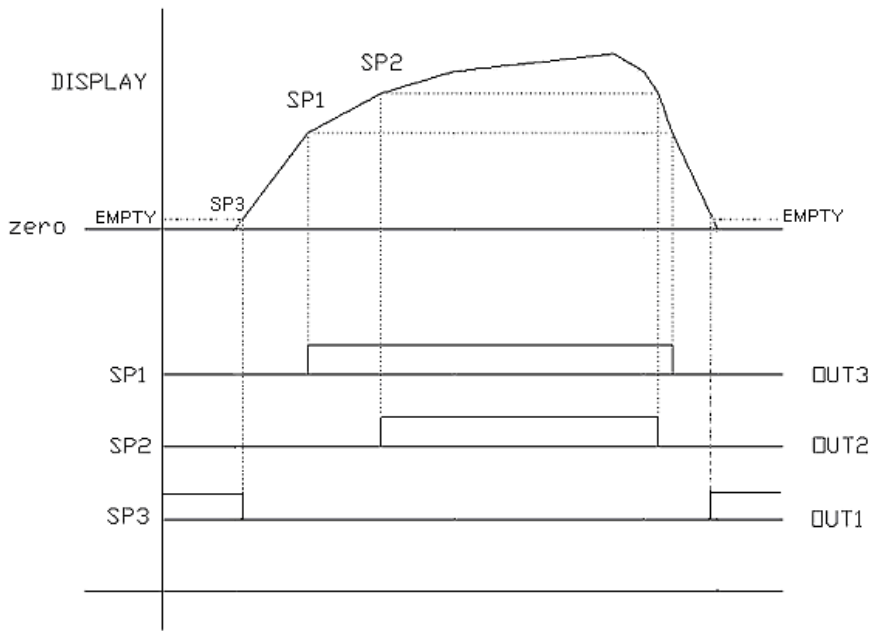
Gauging mode selection

F21	●	1	Relay out mode 1 Normal Batching (Limit)
		2	Relay out mode 2 Programming Batching (Packer)
		3	Relay out mode 3 Comparison mode (Checker 1)
		4	Relay out mode 4 Comparison mode (Checker 2)
		5	Relay out mode 5 Comparison mode (Checker 3)

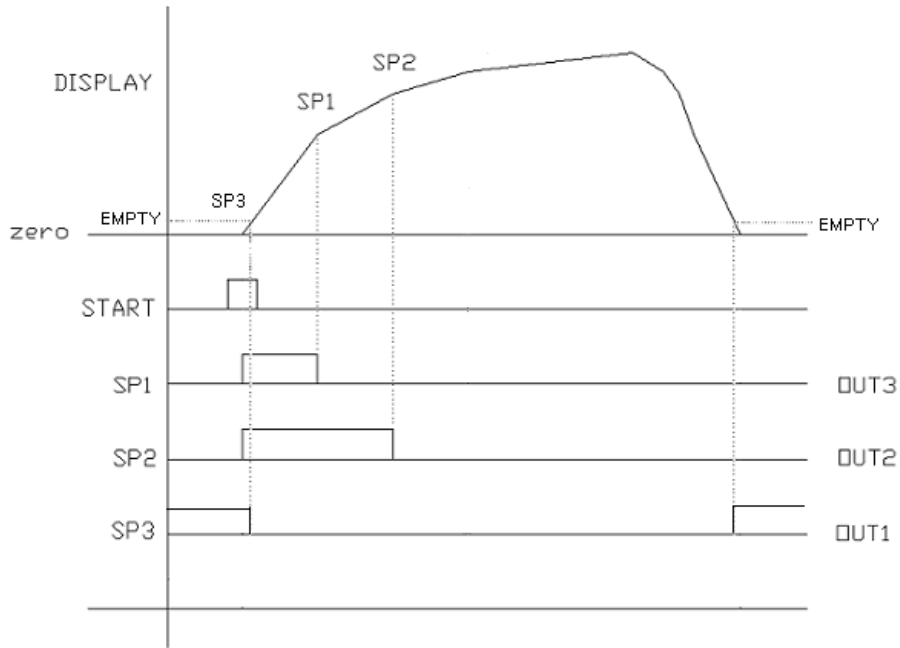
Relay output (control purpose)

Relay output		OUT 3	OUT 2	OUT 1			
1	Limit (controller)	SP1 (low limit)	SP2 (high limit)	SP3 (zero point)			
2	Packer (packing machine)	SP1 (low limit)	SP2 (high limit)	SP3 (zero point)			
3	Checker 1 (select weight)	SP1 (low limit)	SP2 (high limit)	SP3 (complete)			
4	Checker 2 (mode decision)	SP1 (low limit)	SP2 (high limit)	SP3 (complete)			

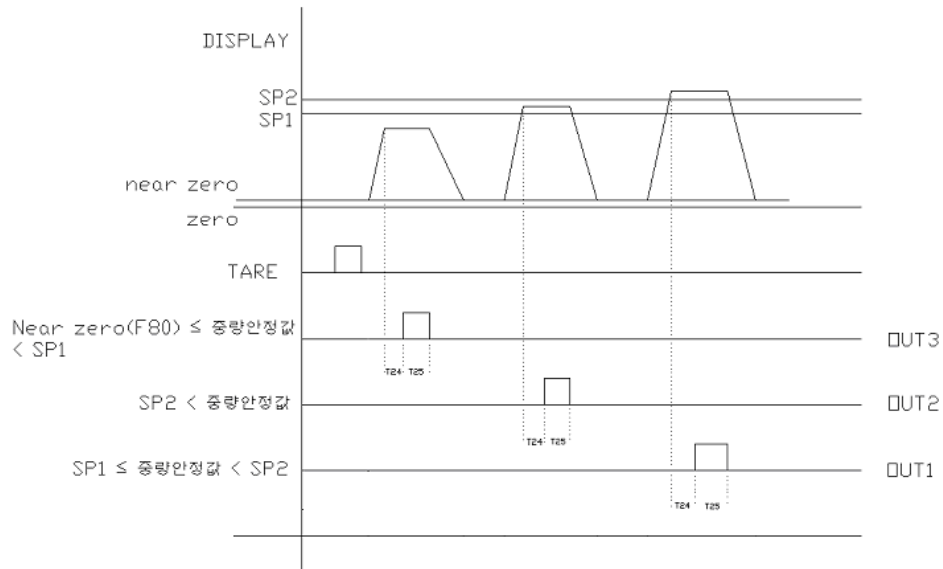
1. Out Mode 1: Normal Batching (Limit Mode)



2.Out mode 2: Programming Batching (Packer Mode 1)

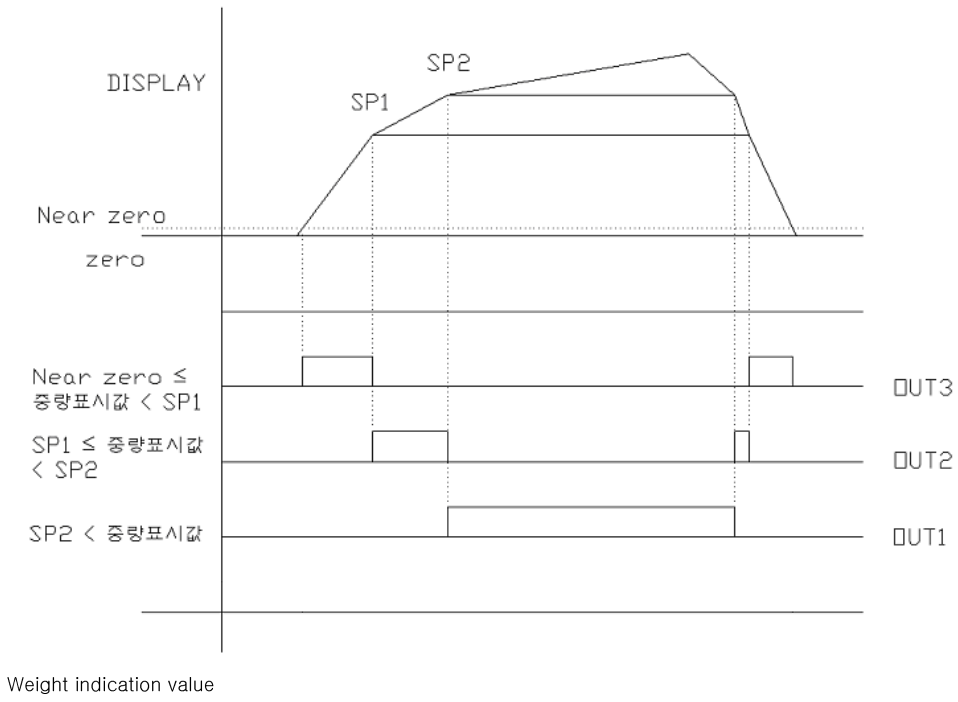


3. Out Mode 3: Comparison Mode 1 (checker mode)



Weight stable value

4. Out Mode 4: Comparison Mode 2 (checker mode 2)



Gauging completion Relay output delay time (F21-01, 02LIMIT, with Packer setting)			
F22	10	00 ~ 99	<p style="text-align: right;">stable point</p> <p style="text-align: right;">delay time</p> <p style="text-align: right;">completion output</p> <p>Sets the delay time until the Relay operation after the SP2 Relay * Reference 00: When the weight is stable, Relay output 01: after 0.1 seconds, Relay output 99: after 9.9 seconds, Relay output</p>

Gauging completion Relay output ON time (F21-01, 02LIMIT, with Packer setting)			
F23	10	01 ~ 99	<p style="text-align: right;">stable point</p> <p style="text-align: right;">on time</p> <p style="text-align: right;">completion output</p> <p>Sets the gauging completion Relay ON time. * Reference 01: Relay ON for 0.1 seconds 99: Relay ON for 9.9 seconds</p>

Gauging decision Relay output delay time (Checker Mode 3, 4, 5)			
F24	10	01 ~ 99	<p>안정점 Stable point</p> <p>판정 Delay time Decision</p> <p>t3: 지연시간 Com 1, 2, 3</p> <p>Sets the delay time until decision Relay operation, after complete gauging. * Reference 00: after 0.1 seconds, Relay output 99: after 9.9 seconds, Relay output</p>

Gauging decision Relay output ON time (Checker Mode 3, 4, 5)			
F25	10	00 ~ 99	<p>안정점 Stable point</p> <p>t4: ON 시간 ON time</p> <p>판정 Com 1, 2, 3</p> <p>It can set the gauging completion Relay ON time. * Reference 01 : Relay ON for 0.1 seconds 99 : Relay ON for 9.9 seconds</p>

※Communication setting

Serial communication Parity Bit setting mode			
F30	<input checked="" type="radio"/>	0	No Parity
	<input type="radio"/>	1	Odd Parity
	<input type="radio"/>	2	Even Parity

Serial communication: communication speed selection			
F31	<input type="radio"/>	0	115,200 bps
	<input type="radio"/>	1	76,800 bps
	<input type="radio"/>	2	57,600 bps
	<input type="radio"/>	3	38,400 bps
	<input type="radio"/>	4	28,800 bps
	<input type="radio"/>	5	19,200 bps
	<input type="radio"/>	6	14,400 bps
	<input checked="" type="radio"/>	7	9,600 bps
	<input type="radio"/>	8	4,800 bps
	<input type="radio"/>	9	2,400 bps

Serial communication mode (when F33 is set at "0")			
F32	<input checked="" type="radio"/>	0	Stream Mode: outputs weight value continuously
	<input type="radio"/>	1	Stable Mode: DATA output simultaneously when gauging
	<input type="radio"/>	2	DATA output when print key is pressed

Serial communication method			
F33	<input type="radio"/>	0	One-way transmission Mode
	<input checked="" type="radio"/>	1	Command Mode
	<input type="radio"/>	2	LCD Mode
	<input type="radio"/>	4	External indicator Mode

Equipment number (ID NUMBER) setting			
F34	1	1~99	This number is set to distinguish between different equipment.

Transmission data FORMAT			
F35	<input checked="" type="radio"/>	0	Basic FORMAT
	<input type="radio"/>	1	CAS FORMAT

BCC Selection mode			
F36	<input checked="" type="radio"/>	0	Not using BCC
	<input type="radio"/>	1	Using BCC

Average display indication setting mode			
F53	●	0	Not operating.
		1 – 99	Operating. (The higher value, the response speed of the weight value that is indicated on the display is the slower.
Steady LED Status Lamp Delay time setting			
F54	●	0	Not Use
		1 ~ 99	Delay during 0.1 ~ 9.9sec, and LED lamp will be ON.




NEAR ZERO (EMPTY) range setting		
F80	XXX	<p>It is near the zero point range for the empty status of gauge checking.</p> <p>Ex.) 000: Near Zero point Relay is in operation when the weight indication is "0"</p> <p>010: Near Zero point Relay is operating when the weight indication is less than "10"</p> <p>150: Near Zero Relay is operating when the weight indication is less than "150"</p>

Zero point indication range setting		
F81	XXXXXX	<p>This function sets the indication range to zero points.</p> <p>Ex.) When it is set at 50, all values less than this are displayed at 0.</p>

Zero point deduction value setting	
F82	<p>If the value is input in F82, it indicates this value after deducting the value set at zero points.</p> <p>Ex) When the zero point value is set at 1000, the value that is indicated as 6000 in Test1 mode will be displayed after deducting 1000, which is 5000.</p>

Maximum value setting for analog output	
F83	<p>The maximum value of the analog output is set to 0 – 10V, 4 – 20mA.</p> <p>Ex) If it is set at 1000, when the weight value reaches 1000, the output is 10V or 20mA</p>

Equivalent input value checking and setting for	
F85	Users can check and change the equivalent input value.

Calibration Span constant checking	
F89	<p>When changing the number to 80 by using the  and  Keys in F-Function mode, and pressing the  Key, the SPAN constant value is displayed.</p>

Chapter 8. INTERFACE

8-1. RS-232 Interface (additional option)



Number	Name	Usage
2	RXD	RS-232 receiving
3	TXD	RS-232 sending
5	GND	RS-232 common

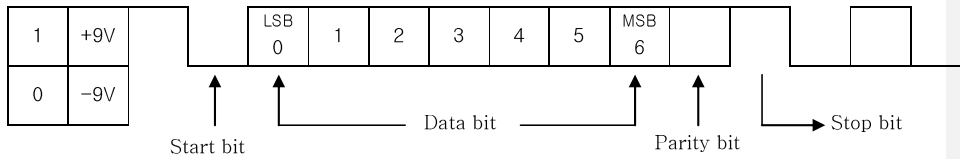
RS-232C Interface is sensitive to electric noise.

Therefore, pipe it separately from the AC Power Cable or electric cables. And must use Shield Coax Cable only.

Communication mode: It can be set in F-Function (F30-F35).

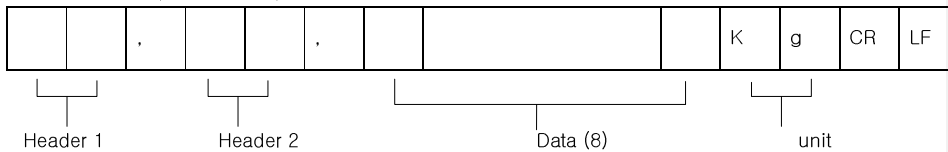
▶ Signal Format

- ①Type: EIA-RS-232C
- ②Method: Half-Duplex, Full-Duplex, asynchronous mode
- ③Baud-rate: selection available among 2400, 4800, 9600, 19200, 38400, 57600, 78600, 115200
- ④Data bit: 7 or 8 (No, Parity)
- ⑤Stop bit: 1
- ⑥Parity bit: selection available among Even, Odd, No, Parity
- ⑦Code: ASCII



⑧printer format

Data format1 (Basic format)



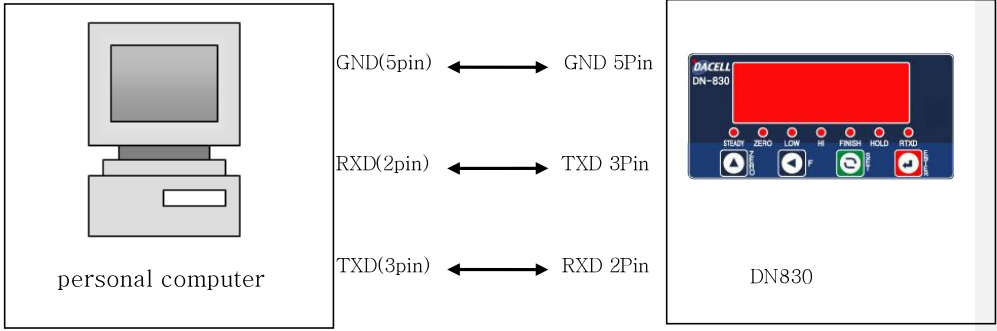
▶ Header 1 (Data format 2, 3 common items)

- OL: OVER LOAD, UNDER LOAD
- ST: indicator stable
- US: indicator unstable

▶ Header 2 (Data format 2, 3 common items)

- NT: NETWEIGHT (actual weight)
- GS: GROSS WEIGHT (total weight)

► Connection to PC (Personal Computer) or other equipment



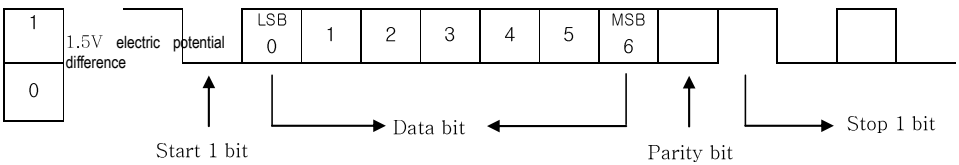
8-2. RS-422 Series communication (Option) (additional option)

RS-422 method transmits signals by the difference in voltages, which is more stable during electric noise than other communication methods. Piping it separately from the AC Power Cable or electric pipes. And must use Shield Coax Cable only.

For advisable usage distance, please use leased circuit with 1.2km.

▶ SIGNAL FORMAT

- ① TYPE: RS-422
- ② FORMAT:
 - Ⓐ Baud-Rate: Select among 2400 ~ 115200
 - Ⓑ Data Bit: 7 or 8 (No Parity)
 - Ⓒ Stop: 1
 - Ⓓ Parity Bit: select among Even, Odd, No Parity



▶ DATA FORMAT

Same as RS-232C

▶ RS-422 circuit (4P Connector)



Indicator

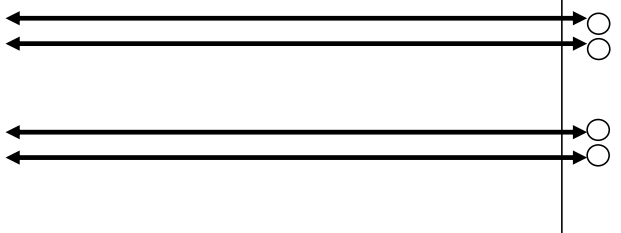
8 TXD(+)
9 TXD(-)

6 RXD(+)
7 RXD(-)

Position on PC

RxD(+)
RxD(-)

TxD(+)
TxD(-)

















※ Reference

























Among above signal level conversion methods, regardless of the method used, eventually, a remote connection with the power in sending side through a communication line (specifically, a grounding line) is most likely to cause an issue. The noise flow through this grounding line can make the system on the receiver or sender side unstable. Due to this, for long distance transmissions or if the surroundings have great deal of communication system noise, disconnecting and separating the system power from the power of the communication line is recommended.

► COMMAND MODE

1. READ COMMAND [Start(STX ) , End(ETX ) , Succeed(ACK ) , Failed(NAK )]

PC→Indicator Format	 01RSNO (ASCII) 02 30 31 52 53 4E 4F 03 (HEX)	Serial No.
Response from Indicator	 01RSND000000 (ASCII) 02 30 31 52 53 4E 4F 30 30 30 30 30 06 03 (HEX)	
PC→Indicator Format	 01RCNO (ASCII) 02 30 31 52 43 4E 4F 03 (HEX)	Code No.
Response from Indicator	 01RCND00005B (ASCII) 02 30 31 52 43 4E 4F 30 30 30 30 35 38 06 03 (HEX)	
PC→Indicator Format	 01RPNO (ASCII) 02 30 31 52 50 4E 4F 03 (HEX)	Part No.
Response from Indicator	 01RPND19 (ASCII) 02 30 31 52 50 4E 4F 31 39 06 03 (HEX)	
PC→Indicator Format	 01RTAR (ASCII) 02 30 31 52 54 41 52 03 (HEX)	TARE weight value
Response from Indicator	 01RTARD00075B (ASCII) 02 30 31 52 54 41 52 30 30 30 37 35 38 06 03 (HEX)	
PC→Indicator Format	 01RCWT (ASCII) 02 30 31 52 43 57 54 03 (HEX)	Current Weight value
Response from Indicator	 01RCWTSTNT+00027.6kg (ASCII) 02 30 31 52 43 57 54 53 54 4E 54 2B 30 30 30 32 37 2E 36 6B 67 06 03 (HEX)	
Remark	STX(1) ID(2) Command(4) Status1(2) Status2(2) Symbol(1) Weight (Include decimal point)(7) Unit(2) ACK(1) ETX(1) = Total 23 BYTE	
PC→Indicator Format	 01RSP1 (ASCII) 02 30 31 52 53 50 03 (HEX)	Low (SP1) DATA
Response from Indicator	 01RSP1001000 (ASCII) 02 30 31 52 53 50 31 30 30 31 30 30 30 06 03 (HEX)	
PC→Indicator Format	 01RSP2 (ASCII) 02 30 31 52 53 50 03 (HEX)	High (SP2) DATA
Response from Indicator	 01RSP2002000 (ASCII) 02 30 31 52 53 50 32 30 30 32 30 30 06 03 (HEX)	

2. WRITE COMMAND [Start(STX ) , End(ETX ) , Succeed(ACK ) , Failed(NAK )]

RxD & TxD	Transfer & Response display	Command
PC→Indicator Format	 01WTAR  (ASCII) 02 30 31 57 54 41 52 03 (HEX)	TARE input
Response from Indicator	 01WTAR  (ASCII) 02 30 31 57 54 41 52 06 03 (HEX)	
PC→Indicator Format	 01WTRS  (ASCII) 02 30 31 57 54 52 53 03 (HEX)	TARE RESET
Response from Indicator	 01WTRS  (ASCII) 02 30 31 57 54 52 53 06 03 (HEX)	
PC→Indicator Format	 01WZER  (ASCII) 02 30 31 57 5A 45 52 03 (HEX)	ZERO input
Response from Indicator	 01WZER  (ASCII) 02 30 31 57 5A 45 52 06 03 (HEX)	
PC→Indicator Format	 01WSND000058  (ASCII) 02 30 31 57 43 4E 4F 30 30 30 30 35 38 03 (HEX)	Serial No. Change
Remark	STX(1) ID(2) Command(4) S/N(6) ETX(1)	
Response from Indicator	 01WSND  (ASCII) 02 30 31 57 53 4E 4F 06 03 (HEX)	
PC→Indicator Format	 01WPND19  (ASCII) 02 30 31 57 50 4E 4F 31 39 03 (HEX)	Part No. Change
Remark	STX(1) ID(2) Command(4) P/N(2) ETX(1)	
Response from Indicator	 01WPND  (ASCII) 02 30 31 57 50 4E 4F 06 03 (HEX)	
PC→Indicator Format	 01WCND000058  (ASCII) 02 30 31 57 43 4E 4F 30 30 30 30 35 38 03 (HEX)	Code No. Change
Remark	STX(1) ID(2) Command(4) Code(6) ETX(1)	
Response from Indicator	 01WCND  (ASCII) 02 30 31 57 43 4E 4F 06 03 (HEX)	

PC→Indicator Format	01WHOL (ASCII) 02 30 31 57 4B 4F 4C 03 (HEX)	Hold input
Response from Indicator	01WHOL (ASCII) 02 30 31 57 4B 4F 4C 06 03 (HEX)	
PC→Indicator Format	01WHRS (ASCII) 02 30 31 57 4B 52 53 03 (HEX)	Hold RESET
Response from Indicator	01WHRS (ASCII) 02 30 31 57 4B 52 53 06 03 (HEX)	
PC→Indicator Format	01WSTR (ASCII) 02 30 31 57 53 54 52 03 (HEX)	Start(Run) Input (F21 – 02) (PACK MODE)
Response from Indicator	01WSTR (ASCII) 02 30 31 57 53 54 52 06 03 (HEX)	
PC→Indicator Format	01WSTO (ASCII) 02 30 31 57 53 54 4F 03 (HEX)	STOP Input (F21 – 02) (PACK MODE)
Response from Indicator	01WSTO (ASCII) 02 30 31 57 53 54 4F 06 03 (HEX)	
PC→Indicator Format	01WSP1000200 (ASCII) 02 30 31 57 53 50 31 30 30 32 30 30 03 (HEX)	Low (SP1) set value change
Remark	STX(1) ID(2) Command (4) Low<SP1>(6) ETX(1)	
Response from Indicator	01WSP1 (ASCII) 02 30 31 57 53 50 31 06 03 (HEX)	
PC→Indicator Format	01WSP2000400 (ASCII) 02 30 31 57 53 50 32 30 30 34 30 30 03 (HEX)	High (SP2) set value change
Remark	STX(1) ID(2) Command (4) High<SP2>(6) ETX(1)	
Response from Indicator	01WSP2 (ASCII) 02 30 31 57 53 50 32 06 03 (HEX)	

8-3. 4~20mA (0~10V) Serial Interface (additional option)



Number	Name	Usage
1	OUT	Current and voltage output terminal
5	GND	Output common terminal.


Related to analog output


- Function F-83

Maximum value setting for analog output


F83	It is to set maximum value for analog output in 0 ~ 10V, 4 ~ 20mA.
	Ex) If setting value is 1000, when the weight value reaches 1000, the output is 10V or 20mA.

- If going into Test 2 key test mode related to analog setting

Press the  key, then 4mA (or 0V) output is presented.

Press the  key, then 12mA (or 5V) output is presented.

Press the  key, then 20mA (or 10V) is presented.

Press the  key, then move to Test. (EXIT)